

Appendix B

Human Health Risk Assessment Tables and Spreadsheets

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Table B-1. ARA-01 contaminant screening.

COPC	Detects/ Samples	Maximum Detected Concentration (mg/kg or pCi/g)	INEEL Background Concentration (mg/kg or pCi/g)	10 × INEEL Background Concentration (mg/kg or pCi/g)	EPA Region 3 Risk-based Concentration (mg/kg or pCi/g)	COPC?
Acetone	1/20	0.007			7,800	No
Aluminum	35/35	22,500	16,000	160,000	78,000	No
Antimony	21/35	16.8	4.8		31	No
Arsenic	7/35	25.8	5.8		0.43	Yes
Barium	35/35	293	300		5,500	No
Beryllium	35/35	2.2	1.8		0.15	Yes ^a
Cadmium	35/35	3.8	2.2		39	No
Calcium	35/35	183,000	24,000	240,000		No
Chromium	35/35	69	33		390	No
Cobalt	35/35	12.4	11		4,700	No
Copper	31/35	25.5	22		3,100	No
Iron	35/35	23,600	24,000	240,000	23,000	No
Lead	35/35	43.9	17			Yes
Magnesium	35/35	19,500	12,000	120,000		No
Manganese	35/35	452	490		390	No
Methylene chloride	3/20	0.026			85	No
Nickel	35/35	34.5	35		1,600	No
Potassium	35/35	5,120	4,300	43,000		No
Selenium	7/35	27.7	0.22		390	No
Silver	35/35	12.7			390	No
Sodium	35/35	2,610	320	3,200		No
Thallium	21/35	59.2	0.43			Yes
Toluene	1/20	0.004			16,000	No
Vanadium	35/35	68	45		550	No
Zinc	35/35	233	150		23,000	No
Am-241	17/35	0.113	0.011			Yes
Cs-137	2/2	1.53	0.82			Yes
Pu-238	2/35	0.0147	0.0049			Yes
Pu-239/240	18/35	0.533	0.10			Yes
Ra-226	2/2	3.08				Yes
Sr-90	8/35	0.628	0.49			Yes
U-234	35/35	1.09	1.44			No
U-235	35/35	0.443				Yes
U-238	35/35	0.977	1.40			No

a. The contaminant was subsequently eliminated as a contaminant of potential concern (COPC) (see Section 3.4).

Note: A blank entry for a contaminant indicates that no data are available.

Table B-2. ARA-02 soils contaminant screening.

Contaminant	Detects/ Samples	Maximum Detected Concentration (mg/kg or pCi/g)	INEEL Background Concentration (mg/kg or pCi/g)	10 × INEEL Background Concentration (mg/kg or pCi/g)	EPA Region 3 Risk-based Concentration (mg/kg or pCi/g)	COPC?
1,1-Dichloroethane	1/5	0.97			7,800	No
1,1-Dichloroethene	0/5	ND ^a			1.1	No
1,2-Dichloroethene	0/5	ND			780	No
1,4-Dichlorobenzene	0/5	ND			27	No
1,1,1-Trichloroethane	3/18	ND			7,000	No
Trichlorotrifluoroethane	2/5	0.004			1,000,000	No
2-Butanone	1/5	0.011			47,000	No
4-Chloroaniline	0/5	ND			310	No
4-Methylphenol	0/5	ND			390	No
Acetone	0/5	ND			7,800	No
Aluminum	10/10	11,600	16,000	160,000	78,000	No
Antimony	0/5	ND	4.8		31	No
Aroclor-1242	0/5	ND			0.083	No
Aroclor-1248	0/5	ND			0.083	No
Aroclor-1254	0/5	ND			1.6	No
Aroclor-1260	0/5	ND			0.083	No
Arsenic	10/10	7.5	5.8		0.43	Yes
Barium	10/10	1,000	300		5,500	No
Benzene	0/5	ND			22	No
Beryllium	9/10	1.7	1.8		0.15	No
Bis (2-ethylhexyl) phthalate	1/10	0.099			46	No
Butylbenzylphthalate	0/5	ND			16,000	No
Cadmium	2/5	1.5	2.2		39	No
Calcium	10/10	120,000	24,000	240,000		No
Carbon disulfide	0/5	ND			7,800	No
Chloroform	0/5	ND			100	No
Chromium	10/10	183	33		390	No
Cobalt	5/10	11.5	11		4,700	No
Copper	6/10	26.3	22		3,100	No
Dichlorodifluoro-methane	3/5	0.008			16,000	No
Diethylphthalate	1/5	0.34			63,000	No
Di-n-butylphthalate	0/5	ND			7,800	No
Ethylbenzene	0/5	ND			7,800	No
Fluoride	8/8	ND			4,700	No
Iron	10/10	19,200	24,000	240,000	23,000	No
Isophorone	0/5	ND			670	No
Lead	5/5	12.1	17			No
Magnesium	9/10	14,300	12,000	120,000		No
Manganese	10/10	397	490		390	No
Mercury	0/5	ND	0.05		23	No
Nickel	10/10	27.8	35		1,600	No

Table B-2. (continued).

Contaminant	Detects/ Samples	Maximum Detected Concentration (mg/kg or pCi/g)	INEEL Background Concentration (mg/kg or pCi/g)	10 × INEEL Background Concentration (mg/kg or pCi/g)	EPA Region 3 Risk-based Concentration (mg/kg or pCi/g)	COPC?
Phenanthrene	0/5	ND				No
Phenol	0/5	ND			47,000	No
Potassium	10/10	1,900	4,300	43,000		No
Selenium	0/5	ND	0.22		390	No
Silver	0/10	ND			390	No
Sodium	6/10	1,980	320	3,200		No
Tetrachloroethene	1/5	0.004			12	No
Toluene	5/10	0.011			16,000	No
Trichloroethene	1/5	0.007			58	No
Trichlorofluoro-methane	1/5	0.001			23,000	No
Vanadium	10/10	38.9	45		550	No
Xylene	3/10	0.003			160,000	No
Zinc	5/10	53.7	150		23,000	No
Am-241	2/10	0.011	0.011			No
Cs-137	3/5	0.438	0.82			No
Pu-239/240	0/5	ND	0.10			No
Ra-226	5/5	2.38	2.22			Yes
Sr-90	2/5	17	0.49			Yes
U-234	9/10	3.5	1.44			Yes
U-235	5/10	0.0506				Yes
U-238	9/10	0.802	1.40			No

a. ND = nondetect.

Note: A blank entry for a contaminant indicates that no data are available.

Table B-3. ARA-02 seepage pit contaminant screening.

Contaminant	Detects/ Samples	Maximum Detected Concentration (mg/kg or pCi/g)	INEEL Background Concentration (mg/kg or pCi/g)	10 × INEEL Background Concentration (mg/kg or pCi/g)	EPA Region 3 Risk-based Concentration (mg/kg or pCi/g)	COPC?
1,1,1-Trichloroethane	1/6	0.048			7,000	No
2-Butanone	1/6	0.092			47,000	No
4-Chloroaniline	3/7	6.4			310	No
Acetone	2/13	0.61			7,800	No
Aluminum	14/14	16,000	16,000	160,000	78,000	No
Antimony	3/11	17.5	4.8		31	No
Aroclor-1242	10/13	23.46			0.083	Yes
Aroclor-1254	1/6	0.588			1.6	No
Arsenic	14/14	70.7	5.8		0.43	Yes
Barium	14/14	493	300		5,500	No
Beryllium	11/14	1.3	1.8		0.15	No
Bis (2-ethylhexyl) phthalate	10/16	9.5			46	No
Cadmium	10/11	222	2.2		39	Yes
Calcium	7/7	55,000	24,000	240,000		No
Carbon disulfide	3/6	0.015			7,800	No
Chromium	14/14	2,800	33		390	Yes
Cobalt	7/7	53.2	11		4,700	No
Copper	13/14	4,040	22		3,100	Yes
Diethyleneether	2/7	0.041				Yes
Diethylphthalate	1/6	0.48			63,000	No
Di-n-butylphthalate	9/13	300			7,800	No
Ethylbenzene	4/13	0.008			7,800	No
Iron	14/14	30,800	24,000	240,000	23,000	No
Lead	14/14	1,290	17			Yes
Magnesium	14/14	8,580	12,000	120,000		No
Manganese	14/14	372	490		390	No
Mercury	10/11	13.4	0.05		23	No
Methylene chloride	3/7	0.27			85	No
Methyl methacrylate	2/7	16			6,300	No
Nickel	14/14	5,890	35		1,600	Yes
Potassium	4/7	2,220	4,300	43,000		No
Selenium	10/11	29.6	0.22		390	No
Silver	13/14	807			390	Yes
Sodium	11/14	564	320	3,200		No
Tetrachloroethene	1/13	0.004			12	No
Toluene	10/16	0.062			16,000	No
Trichloroethene	1/6	0.007			58	No
Trichlorofluoro-methane	7/10	0.011			23,000	No
Vanadium	7/7	438	45		550	No
Xylene	5/16	0.034			160,000	No
Zinc	10/14	1,100	150		23,000	No

Table B-3. (continued).

Contaminant	Detects/ Samples	Maximum Detected Concentration (mg/kg or pCi/g)	INEEL Background Concentration (mg/kg or pCi/g)	10 × INEEL Background Concentration (mg/kg or pCi/g)	EPA Region 3 Risk-based Concentration (mg/kg or pCi/g)	COPC?
Ag-108m	1/7	0.23				Yes
Am-241	4/9	2.7	0.011			Yes
Co-60	10/11	165				Yes
Cs-134	1/7	0.404				Yes
Cs-137	14/16	178	0.82			Yes
Eu-152	10/10	35.2				Yes
Eu-154	6/7	2.27				Yes
Nb-95	2/7	0.272				Yes ^a
Np-237	7/7	0.712				Yes
Pu-238	6/7	0.375	0.0049			Yes
Pu-239/240	8/13	7.4	0.10			Yes
Ra-226	9/10	89.6				Yes
Sr-90	11/13	215	0.49			Yes
Tc-99	7/7	63.9				Yes
Th-228	5/7	0.757	1.6			No
Th-230	7/7	4.50	1.41			Yes
Th-232	5/7	0.529	1.6			No
Th-234	7/7	142				Yes ^a
U-234	14/16	1,250	1.44			Yes
U-235	16/19	120				Yes
U-238	14/16	190	1.40			Yes

a. The contaminant was subsequently eliminated as a contaminant of potential concern (COPC) (see Section 3.4).

Note: A blank entry for a contaminant indicates that no data are available.

Table B-4. ARA-03 contaminant screening.

Contaminant	Detects/ Samples	Maximum Detected Concentration (mg/kg or pCi/g)	INEEL Background Concentration (mg/kg or pCi/g)	EPA Region 3 Risk-based Concentration (mg/kg or pCi/g)	COPC?
Arsenic	15/18	9.1	5.8	0.43	Yes ^a
Barium	18/18	203	300	5,500	No
Cadmium	6/18	1.7	2.2	39	No
Chromium	6/18	16.8	33	390	No
Lead	10/18	10.5	17		No
Cs-137	6/6	7.4	0.82		Yes

Note: A blank entry for a contaminant indicates that no data are available.

a. The contaminant was subsequently eliminated as a contaminant of potential concern (COPC) (see Section 3.4).

Table B-5. ARA-10^a contaminant screening.

Contaminant	Detects/ Samples	Maximum Detected Concentration (mg/kg or pCi/g)	INEEL Background Concentration (mg/kg or pCi/g)	EPA Region 3 Risk-based Concentration (mg/kg or pCi/g)	COPC?
Ra-226	2/2	2.15	2.22		No

a. The site was eliminated from quantitative evaluation based on contaminant screening. See Section 3.1.10.

Note: A blank entry for a contaminant indicates that no data are available.

Table B-6. ARA-12 contaminant screening.

Contaminant	Detects/ Samples	Maximum Detected Concentration (mg/kg or pCi/g)	INEEL Background Concentration (mg/kg or pCi/g)	10 × INEEL Background Concentration (mg/kg or pCi/g)	EPA Region 3 Risk-based Concentration (mg/kg or pCi/g)	COPC?
Aluminum	24/24	12100	16000	160,000	78,000	No
Arsenic	24/24	8.3	5.8		0.43	Yes ^a
Benzo(a)pyrene	1/24	0.056			0.088	No
Beryllium	3/15	1.6	1.8		0.15	No
Bis (2ethylhexyl)phthalate	1/24	0.042			46	No
Cadmium	13/24	8.3	2.2		39	No
Calcium	4/4	80,800	24,000	240,000		No
Chromium	24/24	469	33		390	Yes
Cobalt	22/24	9.9	11		4,700	No
Copper	24/24	623	22		3,100	No
Iron	24/24	18,600	24,000	240,000	23,000	No
Lead	24/24	158	17			Yes
Magnesium	24/24	12,300	12,000	120,000		No
Manganese	24/24	570	490		390	Yes
Mercury	7/24	1.4	0.050		23	No
Nickel	24/24	29.2	35		1,600	No
Potassium	24/24	3,710	4,300	43,000		No
Selenium	6/23	2.7	0.22		390	No
Silver	6/24	5.7			390	No
Sodium	21/24	1,160	320	3,200		No
Thallium	1/24	0.24	0.43			No
Vanadium	24/24	30.2	45		550	No
Zinc	24/24	376	150		23,000	No
Ag-108m	17/17	67.2				Yes
Am-241	3/34	0.2	0.011			Yes
Co-60	15/15	25.2				Yes
Cs-137	27/27	4.42	0.82			Yes
Pu-238	2/34	0.14	0.0049			Yes
Pu-239/240	1/34	0.05	0.10			No
U-234	33/34	3	1.44			Yes
U-238	31/34	1.8	1.4			Yes

a. The contaminant was subsequently eliminated as a contaminant of potential concern (COPC) (see Section 3.4).

Note: A blank entry for a contaminant indicate that no data are available.

Table B-7. ARA-16 contaminant screening.

Contaminant	Detects/ Samples	Maximum Detected Concentration (mg/kg or pCi/g)	INEEL Background Concentration (mg/kg or pCi/g)	10 × INEEL Background Concentration (mg/kg or pCi/g)	EPA Region 3 Risk-based Concentration (mg/kg or pCi/g)	COPC?
1,1,1-Trichloroethane	1/25	.032			7,000	No
2-Butanone	2/25	0.002			47,000	No
Aluminum	25/25	10,100	16,000	160,000	78,000	No
Arsenic	25/25	5.3	5.8		0.43	Yes ^a
Barium	25/25	274	300		5,500	No
Beryllium	25/25	1.1	1.8		0.15	No
Cadmium	5/25	0.63	2.2		39	No
Calcium	25/25	76,000	24,000	240,000		No
Chloride	1/25	1.28				Yes
Chromium	25/25	18.4	33		390	No
Cobalt	25/25	9.4	11		4,700	No
Copper	25/25	15	22		3,100	No
Cyanide	25/25	0.431			1,600	No
Di-n-butylphthalate	1/25	0.160			7800	No
Fluoride	25/25	4.77			4700	No
Iron	25/25	16,300	24,000	240,000	23,000	No
Isobutyl alcohol	2/25	.012			23,000	No
Lead	25/25	13.9	17			No
Magnesium	25/25	12,000	12,000	120,000		No
Manganese	25/25	334	490		390	No
Nickel	25/25	19.3	35		1,600	No
Nitrate	25/25	11.0			130,000	No
Phosphorus	25/25	1.486			1.6	No
Potassium	25/25	2,770	4,300	43,000		No
Sodium	25/25	1080	320	3,200		No
Sulfate	1/25	5.95				Yes
Tetrachloroethene	2/25	0.002			12	No
Thallium	3/25	0.28	0.43			No
Toluene	3/25	0.002			16,000	No
Trichloroethene	2/25	0.011			58	No
Vanadium	25/25	29	45		550	No
Zinc	25/25	83.5	150		23,000	No
Ag-108m	1/25	0.149				Yes
Co-60	20/25	1.15				Yes
Cs-134	2/25	0.321				Yes

Table B-7. (continued).

Contaminant	Detected/ Samples	Maximum Detected Concentration (mg/kg or pCi/g)	INEEL Background Concentration (mg/kg or pCi/g)	10 × INEEL Background Concentration (mg/kg or pCi/g)	EPA Region 3 Risk-based Concentration (mg/kg or pCi/g)	COPC?
Cs-137	25/25	201	0.82			Yes
Eu-152	3/25	1.35				Yes
Eu-154	4/25	0.484				Yes
Mn-54	1/25	0.0549				Yes ^a
Ra-226	17/25	5.27	2.22			Yes
Sr-90	19/25	148	0.49			Yes
Zr-95	2/25	0.261				Yes ^a

a. The contaminant was subsequently eliminated as a contaminant of potential concern (COPC) (see Section 3.4).

Note: A blank entry for a contaminant indicates that no data are available.

Table B-8. ARA-23 contaminant screening.

Contaminant	Detects/ Samples	Maximum Detected Concentration (mg/kg or pCi/g)	INEEL Background Concentration (mg/kg or pCi/g)	EPA Region 3 Risk-based Concentration (mg/kg or pCi/g)	COPC?
Am-241	18/21	0.0317	0.011		Yes
Cs-137	175/176	2140	0.82		Yes
Pu-239/240	3/7	0.0486	0.10		No
Ra-226	35/39	11.9	2.22		Yes
Sr-90	28/29	21.0	0.49		Yes
Th-228	7/7	1.46	1.6		No
Th-230	7/7	1.53	1.41		Yes
Th-232	7/7	1.38	1.6		No
U-234	7/7	0.745	1.44		No
U-235	10/11	0.0469			Yes
U-238	7/7	0.867	1.40		No

Note: A blank entry for a contaminant indicates that no data are available.

Table B-9. ARA-24 contaminant screening.

Contaminant	Detects/ Samples	Maximum Detected Concentration (mg/kg or pCi/g)	INEEL Background Concentration (mg/kg or pCi/g)	EPA Region 3 Risk-based Concentration (mg/kg or pCi/g)	COPC?
Am-241	1/1	0.01	0.011		No
Pu-238	1/1	0.01	0.0049		Yes
Cs-137	3/3	0.597	0.82		No
U-234	1/1	1.11	1.44		No
U-238	1/1	1.08	1.40		No

Note: A blank entry for a contaminant indicates that no data are available.

Table B-10. PBF-04^a contaminant screening.

Contaminant	Detects/ Samples	Maximum Detected Concentration (mg/kg or pCi/g)	INEEL Background Concentration (mg/kg or pCi/g)	EPA Region 3 Risk-based Concentration (mg/kg or pCi/g)	COPC?
Benzene	4/6	0.4		22	No
Ethylbenzene	5/6	6		7,800	No
Toluene	5/6	12		16,000	No
Xylene	6/6	60		160,000	No

a. The site was eliminated from quantitative evaluation. See Section 3.4.
Note: A blank entry for a contaminant indicates that no data are available.

Table B-11. PBF-10 contaminant screening.

Contaminant	Detects/ Samples	Maximum Detected Concentration (mg/kg or pCi/g)	INEEL Background Concentration (mg/kg or pCi/g)	EPA Region 3 Risk-based Concentration (mg/kg or pCi/g)	COPC?
Chromium ^a	10/10	309	33	390	No
Co-58	1/1	0.262			Yes ^b
Cs-137	6/6	17.5	0.82		Yes
Tl-208	2/2	0.47			No ^c

a. Only concentrations from the grids that were not remediated during the interim action have been included.
 b. The contaminant was subsequently eliminated as a contaminant of potential concern (COPC) (see Section 3.4).
 c. Thallium-208 has a very short half-life (i.e., 3.053 minutes), and so was eliminated from further analysis.
 Note: A blank entry for a contaminant indicates that no data are available.

Table B-12. PBF-12 contaminant screening.

Contaminant	Detects/ Samples	Maximum Detected Concentration ^a (mg/kg or pCi/g)	INEEL Background Concentration (mg/kg or pCi/g)	EPA Region 3 Risk-based Concentration (mg/kg or pCi/g)	COPC?
Co-60	6/6	0.36			Yes
Cs-137	9/9	23.3	0.82		Yes
Pu-238	2/2	4.5(1.8) ^b	0.0049		Yes
Sr-90	2/2	1.6(1.0) ^b	0.49		Yes
U-234	2/2	18(5.6) ^b	1.44		Yes
U-235	2/2	1.1(0.27) ^b			Yes
U-238	2/2	3.9(1.5) ^b	1.40		Yes

a. The concentration shown accounts for radioactive decay from 1984 through 1997.
 b. More soil was excavated at the location of maximum concentration. The number in brackets represents second highest sample concentration. To maintain conservatism, the highest concentrations were used in the risk assessment.

Note: A blank entry for a contaminant indicates that no data are available.

Table B-13. PBF-16 contaminant screening.

Contaminant	Detects/ Samples	Maximum Detected Concentration (mg/kg or pCi/g)	INEEL Background Concentration (mg/kg or pCi/g)	EPA Region 3 Risk-based Concentration (mg/kg or pCi/g)	COPC?
Arsenic		2.9	5.8	0.43	No
Cadmium		1.2	2.2	39	No
Chromium		7.0	33	390	No
Lead		32	17		Yes
Mercury		0.71	0.05	23	No
Selenium		< 0.2	0.22	390	No
Silver		< 2		390	No

Note: A blank entry for a contaminant indicates that no data are available.

Table B-14. PBF-21 contaminant screening.

Contaminant	Detects/ Samples	Maximum Detected Concentration ^a (mg/kg or pCi/g)	INEEL Background Concentration (mg/kg or pCi/g)	10 × INEEL Background Concentration (mg/kg or pCi/g)	EPA Region 3 Risk-based Concentration (mg/kg or pCi/g)	COPC?
Acetone	2/4	0.012			7,800	No
Aluminum	4/4	10,000	16,000	16,000	78,000	No
Arsenic	4/4	5.7	5.8		0.43	No
Barium	4/4	175	300		5,500	No
Beryllium	1/4	1.1	1.8		0.15	No
Bis(2-Ethylhexyl)phthalate	4/4	1.9			46	No
Cadmium	2/4	1.5	2.2		39	No
Calcium	4/4	9,200	24,000	24,000		No
Chloride	3/4	3.89				Yes
Chromium	4/4	23.2	33		390	No
Cobalt	2/4	12.6	11		4,700	No
Copper	4/4	23.3	22		3,100	No
Fluoride	1/4	0.54			4,700	No
Iron	4/4	17,300	24,000	240,000		No
Lead	4/4	16.6	17			No
Magnesium	4/4	6,070	12,000			No
Manganese	4/4	410	490		390	No
Nickel	4/4	27.9	35		1,600	No
Nitrate	4/4	9.43			130,000	No
Orthophosphate	2/4	3.88				Yes
Potassium	4/4	2,060	4,300	43,000		No
Selenium	0/4	ND	0.22		390	No
Silver	0/4	ND			390	No
Sodium	0/4	ND	320	3,200		No
Sulfate	1/4	7.28				Yes
Toluene	2/4	0.002			16,000	No
Trichloroethene	2/4	0.002			58	No
Vanadium	4/4	39.9	45		550	No
Zinc	4/4	76	150		23,000	No
Co-60	11/37	3.22				Yes
Cs-137	19/38	14	0.82			Yes
Pu-239/240	3/3	0.065	0.10			No
Sr-90	4/4	0.46	0.49			No
U-234	7/7	1.635	1.44			Yes
U-235	3/3	0.075				Yes
U-238	7/7	1.46	1.4			Yes

a. The radionuclide concentrations shown result from 11 years of contaminant decay.

Note: A blank entry for a contaminant indicates that no data are available.

Table B-15. PBF-22 contaminant screening.

Contaminant	Detects/ Samples	Maximum Detected Concentration (mg/kg or pCi/g)	INEEL Background Concentration (mg/kg or pCi/g)	10 × INEEL Background Concentration (mg/kg or pCi/g)	EPA Region 3 Risk-based Concentration (mg/kg or pCi/g)	COPC?
Aluminum	81/81	18,400	16,000	160,000	7,800	No
Antimony	0/81	ND	4.8		31	No
Aroclor-1248	1/45	0.12			0.083	No
Aroclor-1254	2/45	0.12			1.6	No
Arsenic	92/92	12.2	5.8		0.43	Yes
Barium	80/81	267	300		5,500	No
Beryllium	1/81	1.9	1.8		0.15	Yes ^a
Cadmium	9/81	2.7	2.2		39	No
Calcium	80/81	75,000	24,000	240,000		No
Chromium	80/81	48	33		390	No
Cobalt	3/81	11.6	11		4,700	No
Copper	80/81	48.4	22		3,100	No
Iron	81/81	20,900	24,000	240,000	23,000	No
Lead	92/92	68.4	17			Yes
Magnesium	91/92	9980	12,000	120,000		No
Manganese	80/81	602	490		390	Yes
Mercury	3/81	0.27	0.050		23	No
Nickel	80/81	41	35		1600	No
Potassium	72/81	6,450	4,300	43,000		No
Selenium	14/81	1.7	0.22		390	No
Silver	4/67	11.9			390	No
Sodium	17/81	2810	320	3,200		No
Thallium	0/81	ND	0.43			No
Vanadium	61/81	42.6	45		550	No
Zinc	80/81	164	150		23,000	No
Am-241 ^b	2/73	0.49	0.011/0.0049			Yes
Cs-137	36/36	5.9	0.82			Yes
Pu-238 ^b	2/73	0.49	0.011/0.0049			Yes
Pu-239	1/72	0.26	0.10			Yes
Th-228	82/82	2.7	1.6			Yes
Th-230 ^c	83/83	6.6	1.41/1.44			Yes
Th-232	82/82	2.28	1.6			Yes
U-234 ^c	83/83	6.6	1.41/1.44			Yes
U-238	84/84	2.23	1.40			Yes

a. The contaminant was subsequently eliminated as a contaminant of potential concern (COPC) (see Section 3.4).

b. Analyzed together with one result, and calculations were performed with both radionuclides at the detected concentration.

c. Analyzed together with one result, and calculations were performed with both radionuclides at the detected concentration.

Note: A blank entry for a contaminant indicates that no data are available.

Table B-16. PBF-26 contaminant screening.

Contaminant	Detects/ Samples	Maximum Detected Concentration (mg/kg or pCi/g)	INEEL Background Concentration (mg/kg or pCi/g)	10 × INEEL Background Concentration (mg/kg or pCi/g)	EPA Region 3 Risk-based Concentration (mg/kg or pCi/g)	COPC?
Aluminum	8/8	11,500	16,000	160,000	7,800	No
Aroclor-1254	3/5	13			1.6	Yes
Arsenic	4/4	7.9	5.8		0.43	Yes
Barium	8/8	193	300		5,500	No
Cadmium	2/8	0.68	2.2		39	No
Calcium	8/8	48,100	24,000	240,000		No
Chromium	8/8	64	33		390	No
Cobalt	4/8	7.5	11		4,700	No
Copper	8/8	234	22		3,100	No
Iron	8/8	16,100	24,000	240,000	23,000	No
Lead	8/8	43	17			Yes
Magnesium	8/8	4,800	12,000	120,000		No
Manganese	8/8	398	490		390	No
Mercury	1/4	0.34	0.05		23	No
Nickel	8/8	45	35		1,600	No
Potassium	8/8	1,990	4,300	43,000		No
Silver	5/8	37			390	No
Sodium	5/8	1,310	320	3,200		No
Vanadium	8/8	34	45		550	No
Zinc	8/8	259	150		23,000	No
Am-241	0/2	ND	0.011			No
Co-60	0/2	ND				No
Cs-137	7/8	7.69	0.82			Yes
Pu-238	2/2	0.011	0.0049			Yes
Pu-239/240	0/2	ND	0.10			No
Sr-90	0/2	ND	0.49			No
U-234 ^a	2/2	3.4	1.44			Yes
U-235 ^a	2/2	3.4				Yes
U-238 ^a	2/2	3.4	1.4			Yes

a. The two uranium samples were tested for total uranium content, and the maximum detected concentration was assigned to all three uranium isotopes.

Note: A blank entry for a contaminant indicates that no data are available.

Table B-17. PBF-31^a contaminant screening.

Contaminant ^b	Detects/ Samples	Maximum Detected Concentration (mg/kg or pCi/g)	INEEL Background Concentration (mg/kg or pCi/g)	EPA Region 3 Risk-based Concentration (mg/kg or pCi/g)	COPC?
Bis (2-ethylhexyl) phthalate	1/1	0.380		46	No
Butylbenzylphthalate	1/1	0.460		16,000	No
Diethylphthalate	1/1	0.049		63,000	No
Di-n-butylphthalate	1/1	0.370		7,800	No
Di-n-octylphthalate	1/1	0.430		1,600	No
Phenol	1/1	0.330		47,000	No

a. The site was eliminated from quantitative evaluation based on contaminant screening. See Section 3.4.

b. All contaminants were detected at depths below 10 ft.

Note: A blank entry for a contaminant indicates that no data are available.

Table B-18. PBF-32^a contaminant screening.

Contaminant ^b	Detects/ Samples	Maximum Detected Concentration (mg/kg or pCi/g)	INEEL Background Concentration (mg/kg or pCi/g)	EPA Region 3 Risk-based Concentration (mg/kg or pCi/g)	COPC?
Bis (2ethylhexyl) phthalate	1/1	0.890		46	No
Butylbenzylphthalate	1/1	0.260		16,000	No
Di-n-butylphthalate	1/1	0.210		7,800	No
Naphthalene	1/1	0.170		3,100	No
Phenol	1/1	0.110		47,000	No
Diesel range organics	2/2	130		NA ^b	NA ^c
Gasoline range organics	1/2	0.097		NA	NA ^c

a. The site was eliminated from quantitative evaluation based on contaminant screening. See Section 3.4.

b. All contaminants were detected at depths below 10 ft. Used only for groundwater contamination.

c. Because they are mixtures of numerous individual compounds, diesel range organics and gasoline range organics cannot be evaluated as contaminants of potential concern (COPCs).

Note: A blank entry for a contaminant indicates that no data are available.

Table B-19. Dimensions of sites evaluated in the baseline risk assessment.

Site	Area (m ²)	Maximum Depth of Contamination (m)	Volume (m ³)	Maximum Depth of Surface Soil (m)
ARA-01	2.99E+03	6.10E-01	1.82E+03	6.10E-01
ARA-02 Soils	1.39E+02	3.05E+00	4.24E+02	3.05E+00
ARA-02 Seepage Pit	8.36E+01	3.05E+00	2.55E+02	3.05E+00
ARA-03	6.69E+02	9.15E-01	6.12E+01	3.05E+00
ARA-12	5.75E+03	2.13E+00	1.22E+04	2.13E+00
ARA-16	6.13E+01	3.05E+00	1.87E+02	3.05E+00
ARA-23	1.69E+05	6.10E-01	1.03E+05	3.05E+00
ARA-24	3.82E+04	3.05E+00	1.17E+05	3.05E+00
PBF-05 ^a	NC ^b	NC	NC	NA ^c
PBF-10	1.82E+03	3.05E+00	5.55E+03	3.05E+00
PBF-12	6.27E+01	3.05E+00	1.91E+02	3.05E+00
PBF-16	2.74E+03	3.05E+00	8.36E+03	3.05E+00
PBF-21	3.25E+02	3.05E+00	9.91E+02	3.05E+00
PBF-22	5.01E+03	3.05E+00	1.53E+04	3.05E+00
PBF-26	1.00E+02	3.05E+00	3.00E+02	3.66E+00

a. The PBF-05 vadose zone injection well was evaluated for groundwater risks only using GWSCREEN. Contaminant masses were estimated based on disposal data. Empirical data defining area, depth, and volume are not available. The surface soil depth is not relevant to the PBF-05 vadose zone injection well.

b. NC = not calculated.

c. NA = not applicable.

Table B-20. Contaminant specific reference doses and slope factors by exposure pathway.

Contaminant of Potential Concern	Oral RfD ^a (mg/kg-day)	Oral SF ^a (mg/kg-day) ⁻¹ or (pCi) ⁻¹	Inhalation RfC ^a (mg/m ³)	Inhalation UR or SF ^{a,b} (mg/kg-day) ⁻¹ or (pCi) ⁻¹	External Exposure SF ^a (risk/year per pCi/g)
Antimony	4.0E-04				
Aroclor-1242		4.0E-01			
Aroclor-1248		4.0E-01			
Aroclor-1254	2.0E-05	4.0E-01			
Aroclor-1260		4.0E-01			
Arsenic	3.0E-04	1.8E+00		1.5E+01	
Barium	7.0E-02		1.4E-04		
Bis (2-ethylhexyl) phthalate	2.0E-02	1.4E-02			
Cadmium	5.0E-04			1.8E-03	
Chloride					
Chromium	1.0E+00			1.2E-02	
Chromium(III)	1.0E+00				
Chromium(VI)	5.0E-03			1.2E-02	
Cobalt	6.0E-02		2.9E-04		
Copper	3.7E-02				
1,4-Dichlorobenzene	3.0E-02	2.4E-02	2.3E-01		
1,1-Dichloroethene	9.0E-03	6.0E-01		1.2E+00	
Diethylphthalate	8.0E-01				
Lead					
Manganese	1.4E-01		5.0E-05		
Mercury	3.0E-04		8.6E-05		
Nickel	2.0E-02				
Orthophosphate					
Phenanthrene					
Selenium	5.0E-03				
Silver	5.0E-03				
Sulfate					
Tetrachloroethylene	1.0E-02	5.2E-02		2.0E-03	
Thallium		7.0E-05			
Trichloroethene	6.0E-03	1.1E-02		6.0E-03	
Vanadium	7.0E-03				
Zinc	3.0E-01				
Ag-108m					
Am-241		3.3E-10		3.9E-08	4.6E-09
Co-60		1.9E-11		6.9E-11	9.8E-06
Cs-134		4.7E-11		2.9E-11	5.9E-06
Cs-137		3.2E-11		1.9E-11	2.1E-06
Eu-152		5.7E-12		7.9E-11	4.1E-06
Eu-154		9.4E-12		9.2E-11	4.7E-06
Eu-155		1.7E-12		9.6E-12	6.1E-08
Pu-238		3.0E-10		2.7E-08	1.9E-11
Pu-239/240		3.2E-10		2.8E-08	1.3E-11
Ra-226		3.0E-10		2.8E-09	6.7E-06
Sr-90		5.6E-11		6.9E-11	0.0E+00
Th-228		2.3E-10		9.7E-08	9.9E-07

Table B-20. (continued).

Contaminant of Potential Concern	Oral RfD ^a (mg/kg-day)	Oral SF ^a (mg/kg-day) ⁻¹ or (pCi) ⁻¹	Inhalation RfC ^a (mg/m ³)	Inhalation UR or SF ^{a,b} (mg/kg-day) ⁻¹ or (pCi) ⁻¹	External Exposure SF ^a (risk/year per pCi/g)
Th-230		3.8E-11		1.7E-08	4.4E-11
Th-232		3.3E-11		1.9E-08	2.0E-11
U-234		4.4E-11		1.4E-08	2.1E-11
U-235		4.7E-11		1.3E-08	2.7E-07
U-238		6.2E-11		1.2E-08	5.3E-08

a. The source of information is the Integrated Risk Information Service (IRIS) for nonradionuclides and the Health Effects Assessment Summary Tables for radionuclides (EPA 1995).

b. Unit risks (UR) apply to the nonradionuclide contaminants and slope factors (SF) apply to the radionuclide contaminants.

Table B-21. Parameter values specific to contaminants of potential concern.

COPC	Volatile?	Henry's Law Constant ^a (atm·m ³ /mol)	K _d ^b (cm ³ /g)	K _{oc} ^b (mL/g)	Water Solubility ^b (mg/L)	Diffusivity ^c (cm ² /second)	Half-life ^d (year)	Dermal Permeability ^f (cm/hour)	Plant Uptake Factor	Weight of Evidence ^b	Target Organ and Effects ^b
Antimony	N	— ^d	5.00E+01	—	—	—	—	1.00E-03	5.60E-04 ⁱ	—	Whole body and blood; increased mortality
Aroclor-1242	N	1.07E-03	1.59E+03 ^e	5.30E+05	—	5.57E-02	—	5.58E+00	2.31E-02 ^j	—	None identified
Aroclor-1248	N	1.07E-03	1.59E+03 ^e	5.30E+05	—	5.57E-02	—	6.11E+00	1.14E-02 ^j	—	None identified
Aroclor-1254	N	1.07E-03	1.50E+03	5.30E+05	—	5.57E-02	—	7.57E-01	6.31E+00	8.78E-03 ^j	Immune system; toxicity
Aroclor-1260	N	1.07E-03	7.89E+03	5.30E+05	—	5.57E-02	—	8.49E-01	6.91E+00	3.93E-03 ^j	—
Arsenic	N	—	3.00E+00	—	—	—	—	1.00E-03	4.00E-02 ^j	A	Skin; keratosis and hyperpigmentation
Barium	N	—	5.00E+01	—	—	—	—	1.00E-03	1.50E-01 ⁱ	NA	Oral-cardiovascular system; increased blood pressure and effects fetal inhalation inhal.-fetus; toxicity
Bis (2-ethylhexyl) phthalate	Y	1.00E-04	1.80E+01	1.00E+04	—	3.51E-02	—	3.35E-02	4.20E+00	1.45E-01 ^j	B2
Cadmium	N	—	6.00E+00	—	—	—	—	1.00E-03	5.50E-01 ⁱ	—	Kidney; proteinuria
Chloride	N	—	0.00E+00	—	—	—	—	1.00E-03	1.00E+00	—	None identified
Chromium	N	—	1.20E+00	—	—	—	—	1.00E-03	1.00E-03 ⁱ	A	No observed effects
Chromium(III)	N	—	1.20E+00	—	—	—	—	1.00E-03	1.00E-03 ⁱ	NA	No observed effects
Chromium(VI)	N	—	1.20E+00	—	—	—	—	1.00E-03	1.00E-03 ⁱ	A	No observed effects
Cobalt	N	—	1.00E+01	—	—	—	—	1.00E-03	2.90E-01 ⁱ	—	None identified
Copper	N	—	2.00E+01	—	—	—	—	1.00E-03	8.00E-01 ⁱ	D	Gastrointestinal system; irritation
1,4-Dichlorobenzene	Y	2.89E-03	4.75E-01	1.70E+03	7.90E+01	6.90E-02	—	6.20E-02	3.39E+00	4.25E-01 ^j	B2
1,1-Dichloroethene	N	3.40E-02	1.95E-01 ^e	6.50E+01	2.25E+03	8.39E-02	—	1.60E-02	2.13E+00	2.27E+00 ^j	C
Diethylphthalate	N	1.14E-06	2.08E-01	1.42E+02	—	2.56E-02	—	1.13E-02	2.35E+00	1.70E+00 ^j	D
Lead	N	—	1.00E+02	—	—	—	—	1.00E-03	2.00E-02 ^j	B2	Central nervous systems; neurotoxicity and blood; toxicity
Manganese	N	—	5.00E+01	—	—	—	—	1.00E-03	1.90E+00 ⁱ	D	Oral—Central nervous system; affects inhalation—Central nervous system; impaired

Table B-21. (continued).

COPC	Volatile?	Henry's Law Constant ^a (atm-m ³ /mol)	K _d ^b (cm ³ /g)	K _{oc} ^b (mL/g)	Water			Dermal Permeability ^f (cm/hour)	Log K _{ow} ^g	Plant Uptake Factor	Weight of Evidence ^h	Target Organ and Effects ^b neurobehavioral function
					Solubility ^b (mg/L)	Diffusivity ^c (cm ² /second)	Half-life ^d (year)					
Mercury	N	—	1.00E+02	—	—	—	—	1.00E-03	—	9.00E-01 ⁱ	D	Oral—kidney; affects inhalation—Central nervous system; neurotoxicity
Nickel	N	—	1.00E+02	—	—	—	—	1.00E-03	—	6.00E-02 ^j	NA	Whole body; decreased weight and major organs
Orthophosphate	N	—	0.00E+00	—	—	—	—	1.00E-03	—	1.00E+00	—	None identified
Phenanthrene	Y	1.59E-04	1.57E+01	1.40E+04	1.00E+00	—	—	2.70E-01	4.46E+00	1.02E-01 ^j	D	None identified
Selenium	N	—	4.00E+00	—	—	—	—	1.00E-03	—	2.50E-02 ^j	D	Whole body; clinical selenosis
Silver	N	—	9.00E+01	—	—	—	—	1.00E-03	—	1.30E-03 ^j	D	Skin; argyria
Sulfate	N	—	0.00E+00	—	—	—	—	1.00E-03	—	1.00E+00	—	None identified
Tetrachloroethylene	Y	2.59E-02	6.30E-01	3.64E+02	—	7.85E-02	—	4.80E-02 ⁱ	—	1.22E+00 ^j	B2	Liver; hepatotoxicity
Thallium	N	—	0.00E+00	—	—	—	—	1.00E-03	—	—	—	—
Trichloroethene	Y	9.10E-03	3.78E-01 ^e	1.26E+02	1.10E+03	7.90E-02	—	—	—	—	—	—
Vanadium	N	—	1.00E+03	—	—	—	—	1.00E-03	—	4.00E-03 ^j	—	liver ; increased SGPT, blood ; increased serum LDH, hair ; alopecia
Zinc	N	—	1.60E+01	—	—	—	—	1.60E-02 ^k	2.60E+00	1.22E+00 ^j	C	—
Ag-108m	N	—	—	—	—	—	—	1.00E-03	—	5.50E-03 ^j	NA	No observed effects
Am-241	N	—	3.40E+02	—	—	—	—	4.32E+02	1.00E-03	1.50E+00 ^j	D	Blood ; decreased blood enzyme
Co-60	N	—	1.00E+01	3.30E+03	2.35E+01	—	—	5.27E+00	1.00E-03	1.50E-01 ^j	—	None identified
Cs-134	N	—	5.00E+02	1.67E+05	6.65E+04	—	—	2.06E+00	1.00E-03	2.20E-03 ^j	A	None identified
Cs-137	N	—	5.00E+02	—	—	—	—	3.02E+01	1.00E-03	2.90E-01 ^j	A	None identified
Eu-152	N	—	6.50E+02	—	5.03E+01	—	—	1.36E+01	1.00E-03	4.60E-01 ^j	A	None identified
Eu-154	N	—	6.50E+02	—	5.03E+01	—	—	8.80E+00	1.00E-03	4.60E-01 ^j	A	None identified
Eu-155	N	—	6.50E+02	—	5.03E+01	—	—	4.96E+00	1.00E-03	1.00E-02 ^j	A	None identified
Pu-238	N	—	1.50E+03	—	—	—	—	8.78E+01	1.00E-03	1.00E-02 ^j	A	None identified
Pu-239/240	N	—	1.50E+03	—	—	—	—	2.41E+04	1.00E-03	1.00E-02 ^j	A	None identified
Ra-226	N	—	—	—	—	—	—	1.60E+03	1.00E-03	4.40E-03 ^j	A	None identified

Table B-21. (continued).

COPC	Volatile?	Henry's Law Constant ^a (atm-m ³ /mol)	K _d ^b (cm ³ /g)	K _{oc} ^b (mL/g)	Water Solubility ^b (mg/L)	Diffusivity ^c (cm ² /second)	Half-life ^d (year)	Dermal Permeability ^f (cm/hour)	Log K _{ow} ^g	Plant Uptake Factor	Weight of Evidence ^b	Target Organ and Effects ^h
Sr-90	N	—	2.40E+01	—	—	—	2.86E+01	1.00E-03	4.40E-03 ⁱ	A	None identified	
Th-228	N	—	1.00E+02	3.30E+04	1.00E+06	—	1.91E+00	1.00E-03	1.00E-01 ⁱ	A	None identified	
Th-230	N	—	1.00E+02	3.30E+04	1.00E+06	—	7.70E+04	1.00E-03	3.00E+00 ⁱ	A	None identified	
Th-232	N	—	1.00E+02	3.30E+04	1.00E+06	—	1.41E+10	1.00E-03	3.90E-02 ⁱ	A	None identified	
U-234	N	—	6.00E+00	—	—	—	2.45E+05	1.00E-03	3.90E-02 ⁱ	A	None identified	
U-235	N	—	6.00E+00	—	—	—	7.04E+08	1.00E-03	3.90E-02 ⁱ	A	None identified	
U-238	N	—	6.00E+00	—	—	—	4.47E+09	1.00E-03	1.40E-02 ⁱ	A	None identified	

a. The source of the information in the column is Montgomery and Welkorn (1990).

b. K_d values are from INEEL Track 2 guidance (DOE-ID 1994) unless otherwise noted.c. K_d values were calculated from K_{oc} values: K_d = K_{oc} × 0.003 (DOE-ID 1994).

d. Calculated using information presented in Lyman et al. (1982).

e. Information taken from the Health Effects Assessment Summary Tables (EPA 1995).

f. The figures were calculated using an equation from Becker (1995) unless otherwise noted.

h. Information taken from the Integrated Risk Information Service (IRIS).

i. Value taken from the INEEL White Paper on the Food Crop Ingestion Exposure Route (LMITCO 1996).

j. PUF calculated using the method of Travis and Arms (1988).

k. The source of the information is the U.S. Environmental Protection Agency (1992).

Note: A blank entry for a contaminant indicates that the information is not applicable to the contaminants.

Table B-22. Soil concentration of contaminants of potential concern (mg/kg or pCi/g).

Site	COPC	Depth		
		0 to 6 in.	0 to 4 ft	0 to 10 ft
ARA-01				
	Arsenic	2.21E+01	2.21E+01	2.21E+01
	Lead	2.53E+01	2.76E+01	2.76E+01
	Thallium	3.73E+01	3.58E+01	3.58E+01
	Am-241	7.43E-02	5.02E-02	5.02E-02
	Cs-137	1.53E+00	1.53E+00	1.53E+00
	Pu-238	0.00E+00	7.35E-03	7.35E-03
	Pu-239/240	2.21E-01	1.29E-01	1.29E-01
	Ra-226	3.08E+00	3.08E+00	3.08E+00
	Sr-90	5.76E-01	4.28E-01	4.28E-01
	U-235	6.29E-02	4.27E-02	4.27E-02
ARA-02 Soils	Arsenic	0.00E+00	2.10E+00	3.57E+00
	Ra-226	0.00E+00	1.14E+00	1.71E+00
	Sr-90	0.00E+00	0.00E+00	6.80E+00
	U-234	0.00E+00	3.50E-01	9.02E-01
	U-235	0.00E+00	2.49E-02	3.78E-02
ARA-02 Seepage Pit	Aroclor-1242	0.00E+00	0.00E+00	1.80E+00
	Arsenic	0.00E+00	1.65E+00	7.10E+00
	Cadmium	0.00E+00	0.00E+00	1.30E+01
	Chromium	0.00E+00	9.15E+00	2.11E+02
	Copper	0.00E+00	8.00E+00	3.37E+02
	Diethylether	0.00E+00	0.00E+00	4.10E-03
	Lead	0.00E+00	6.15E+00	1.17E+02
	Nickel	0.00E+00	9.85E+00	4.64E+02
	Silver	0.00E+00	0.00E+00	6.52E+01
	Ag-108m	0.00E+00	0.00E+00	2.30E-02
	Am-241	0.00E+00	7.95E-03	2.75E-01
	Co-60	0.00E+00	0.00E+00	9.58E+00
	Cs-134	0.00E+00	0.00E+00	4.04E-02
	Cs-137	0.00E+00	1.14E-01	1.50E+01
	Eu-152	0.00E+00	0.00E+00	1.64E+00
	Eu-154	0.00E+00	0.00E+00	2.12E-01

Table B-22. (continued).

Site	COPC	Depth		
		0 to 6 in.	0 to 4 ft	0 to 10 ft
	Np-237	0.00E+00	0.00E+00	7.12E-02
	Pu-238	0.00E+00	0.00E+00	3.27E-02
	Pu-239/240	0.00E+00	0.00E+00	3.69E-01
	Ra-226	0.00E+00	3.28E-01	9.60E+00
	Sr-90	0.00E+00	0.00E+00	2.16E+01
	Tc-99	0.00E+00	0.00E+00	6.07E+00
	Th-230	0.00E+00	0.00E+00	4.10E-01
	U-234	0.00E+00	4.07E-01	1.26E+02
	U-235	0.00E+00	2.92E-02	1.20E+01
	U-238	0.00E+00	3.44E-01	1.94E+01
ARA-03	Cs-137	0.00E+00	E+00	5.18E+00
ARA-12	Chromium	4.69E+02	2.86E+02	1.73E+02
	Lead	1.58E+02	8.80E+01	5.42E+01
	Manganese	3.82E+02	4.01E+02	3.64E+02
	Ag-108m	6.72E+01	3.50E+01	2.08E+01
	Am-241	2.00E-01	2.00E-01	2.00E-01
	Co-60	2.52E+01	1.32E+01	7.89E+00
	Cs-137	2.19E+00	1.33E+00	8.37E-01
	Pu-238	1.40E-01	1.40E-01	1.40E-01
	U-234	1.20E+00	1.16E+00	1.02E+00
	U-238	1.13E+00	1.16E+00	1.06E+00
ARA-16	Chloride	1.28E+00	3.20E-01	1.28E-01
	Sulfate	5.95E+00	1.49E+00	5.95E-01
	Ag-108m	1.49E-01	3.73E-02	1.49E-02
	Co-60	5.90E-01	2.23E-01	1.25E-01
	Cs-134	1.90E-01	4.75E-02	5.11E-02
	Cs-137	1.26E+02	3.85E+01	3.18E+01
	Eu-152	1.35E+00	3.38E-01	1.35E-01
	Eu-154	4.84E-01	1.21E-01	4.84E-02
	Ra-226	4.01E+00	1.79E+00	1.66E+00
	Sr-90	8.80E+01	3.31E+01	2.20E+01

Table B-22. (continued).

Site	COPC	Depth		
		0 to 6 in.	0 to 4 ft	0 to 10 ft
ARA-23	Am-241	1.38E-02	1.14E-02	4.55E-03
	Cs-137	2.92E+01	1.02E+01	4.09E+00
	Ra-226	3.62E+00	1.51E+00	6.04E-01
	Sr-90	2.51E+01	7.44E+00	2.98E+00
	Th-230	1.53E+00	7.00E-01	2.80E-01
	U-235	1.24E-01	3.73E-02	1.49E-02
ARA-24	Pu-238	1.00E-02	1.00E-02	1.00E-02
PBF-10	Cs-137	0.00E+00	0.00E+00	5.25E+00
PBF-12	Co-60	0.00E+00	0.00E+00	7.20E-02
	Cs-137	0.00E+00	0.00E+00	4.66E+00
	Pu-238	0.00E+00	0.00E+00	9.00E-01
	Sr-90	0.00E+00	0.00E+00	3.20E-01
	U-234	0.00E+00	0.00E+00	3.60E+00
	U-235	0.00E+00	0.00E+00	2.20E-01
	U-238	0.00E+00	0.00E+00	7.80E-01
PBF-16	Lead	3.20E+01	3.20E+01	3.20E+01
PBF-21	Chloride	0.00E+00	0.00E+00	1.46E+00
	Phosphate	0.00E+00	0.00E+00	1.55E+00
	Sulfate	0.00E+00	0.00E+00	2.91E+00
	Co-60	0.00E+00	0.00E+00	1.24E+00
	Cs-137	0.00E+00	0.00E+00	2.87E+00
	U-234	0.00E+00	0.00E+00	6.52E-01
	U-235	0.00E+00	0.00E+00	3.00E-02
	U-238	0.00E+00	0.00E+00	5.84E-01
PBF-22	Arsenic	6.72E+00	7.76E+00	8.11E+00
	Lead	1.82E+01	1.52E+01	1.40E+01

Table B-22. (continued).

Site	COPC	Depth		
		0 to 6 in.	0 to 4 ft	0 to 10 ft
	Manganese	3.91E+02	3.34E+02	3.06E+02
	Am-241	9.10E-01	5.95E-01	5.32E-01
	Cs-137	1.83E+00	8.99E-01	7.14E-01
	Pu-238	9.10E-01	5.95E-01	5.32E-01
	Pu-239	0.00E+00	1.95E-01	2.34E-01
	Th-228	1.58E+00	1.93E+00	8.62E+01
	Th-230	3.25E+00	2.96E+00	2.46E+00
	Th-232	1.53E+00	1.74E+00	1.94E+00
	U-234	3.23E+00	2.96E+00	2.40E+00
	U-238	1.26E+00	1.34E+00	1.61E+00
PBF-26	Aroclor-1254	1.30E+01	1.30E+01	1.30E+01
	Arsenic	0.00E+00	7.40E+00	7.70E+00
	Lead	4.30E+01	2.35E+01	2.38E+01
	Cs-137	7.69E+00	7.69E+00	7.69E+00
	Pu-238	1.10E-02	1.10E-02	1.10E-02
	U-234	3.40E+00	3.40E+00	3.40E+00
	U-235	3.40E+00	3.40E+00	3.40E+00
	U-238	3.40E+00	3.40E+00	3.40E+00

Table B-23. Average soil concentration (pCi/g) from 0 to 6 in. during the period year 0 to year 25.

COPC	ARA-01	ARA-02 Soils	ARA-02 Seepage											
			Pit	ARA-03	ARA-12	ARA-16	ARA-23	ARA-24	PBF-10	PBF-12	PBF-16	PBF-21	PBF-22	PBF-26
Ag-108m	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.28E+01	1.39E-01	0.00E+00							
Am-241	7.28E-02	0.00E+00	0.00E+00	0.00E+00	1.96E-01	0.00E+00	1.35E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.92E-01	0.00E+00
Co-60	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.38E+00	1.73E-01	0.00E+00							
Cs-134	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.26E-02	0.00E+00							
Cs-137	1.16E+00	0.00E+00	0.00E+00	0.00E+00	1.67E+00	9.59E+01	2.22E+01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.39E+00	5.85E+00
Eu-152	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	7.63E-01	0.00E+00							
Eu-154	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.11E-01	0.00E+00							
Np-237	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Pu-238	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.27E-01	0.00E+00	0.00E+00	9.08E-03	0.00E+00	0.00E+00	0.00E+00	0.00E+00	8.26E-01	9.98E-03
Pu-239/240	2.21E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Ra-226	3.06E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.99E+00	3.60E+00	0.00E+00						
Sr-90	4.32E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	6.60E+01	1.88E+01	0.00E+00						
Tc-99	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Th-228	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.74E-01
Th-230	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.53E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.25E+00	0.00E+00
Th-232	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.53E+00	0.00E+00
U-234	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.20E+00	0.00E+00	3.23E+00	3.40E+00						
U-235	6.29E-02	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.24E-01	0.00E+00	0.00E+00	0.00E+00	0.00E+00	0.00E+00	3.40E+00
U-238	0.00E+00	0.00E+00	0.00E+00	0.00E+00	1.13E+00	0.00E+00	1.26E+00	3.40E+00						

B-26